

Propose with a Rose

Signaling in Internet Dating Markets

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Signaling models

- Costly signaling models (education...)
- Preference Signaling
 - Sending signals is not costly *per se*
 - Everyone can send any signal
 - Cost of signals through limiting their number
 - Need to decide to *whom* to send the signal
- College admission in the US: early action
 - Single early action, but no (other) costs to apply early
- AEA Job Market
 - Can send signals to 2 universities...

Does Preference Signaling work?

Theory: Preference Signaling

- College Admission: Avery & Levin 2009
- Labor markets: Coles, Kushnir and Niederle 2009

Practice: Does a signal increase the chance of success:

- College admission: get an offer.
- Junior econ market: get an interview.

Empirical Work

- In college admission: Avery et al (2003) show that GPA of early admits are lower than of regular admits.
 - Problem: Lots of unobservables, maybe simply a way to reduce competition for financial aid.
- AEA job market (Coles et al, 2010)
 - About 1000 users a year (with about 700 fresh Ph.D.'s)
 - Signals seem to increase the chance of receiving an interview

The goal of this paper

Provide clear evidence that preference signaling increases the chance of success.

Online dating: When making a proposal

- Can add a rose to signal special interest
- 2 roses, 10 offers.
- Randomly chosen 20%: 8 roses.

Advantages of online dating

- While the market is decentralized, it is observable as much as internet transactions can be.
- Unusually detailed information about the participants, and participants have less than unusual unobservable shared information
- Since dating is a continuous market: Can portion off a small part and have a field experiment on it.

Korean Match Making Company

Information about participants

- National Household Registration Card
 - age, birth order, marital history, region, parent's marital status
- Other (legally verifiable) documents
 - education, industry,
- Information provided by participants:
 - income, wealth, religion, father's education, father's occupation parental wealth, head-to-shoulder photo, height, weight...

2/3 of participants: full legal verification, only 3% have no legal verification.

Subset of information: constitutes online profile

Internet dating site

- Company assigns to each participant a desirability grade (0 to 100) – that is a function depending on gender, and other attributes.
- Grade is not visible to participants
- Lee (2009), bigger dataset, show that the desirability grade is a good predictor of behavior: Acceptance of proposed matches, and even marriage.

Participants in the field experiment

Create a thick market: Never married
college educated

Men: 26-38, Women: 22-34.

304 men and 309 women

2 sessions:

one with about 200,

second with about 400 members

Experimental design

Special internet dating event:

- 5 days to make up to 10 offers.
- Day 6: All offers are transmitted at once
- 4 days to respond to offers (max 10 yes)
- Accepted proposal: Exchange of contact information

Special

- Participants can attach a rose to a proposal

SUNOO이벤트팀의 온라인 이벤트

Online LOVE SIGNAL

온라인에서 벌어지는 장미전쟁!
1주일간 온라인에서 열릴 장미전쟁 이벤트!
전자장미를 쟁취하라!
(주말전라 크리보즈 기간을 통해 최대 20번과 온라인 교환 가능!)

이 이벤트는 참가자들이 한두가지뿐만 아니라 다양한 선택지를 경험할 수 있는 온라인 이벤트입니다.
이 시스템은 참가자들이 단시간에 관심 있는 여러사람과의 만남을 가질수 있는 동시에,
전자장미를 이용하여 어떤 사람에게 하루에도 보지 못한 관심을 갖고 있는가를 자연스럽게
표기함으로써 크리보즈를 채택할 수 있도록 설계되었습니다.

1차 세션단 모집안내

- 모집기간 2008년 6월 16일~27일 12일까지
- 모집연령 남성 19~29, 여성 19~29(총 30명)
- 모집대상 남성 1982년생~1996년생
여성 1986년생~1990년생
- 신우 비호회원 중 인증제수 60점 이상
사건공개 필수
- 참가비용 총비용 2만원 / 세션당 1만원

The Battle of Roses with 300 singles in an online space! Obtain E-Roses!

A one-week online event with a maximum of 20 first dates!

This event is designed for participants to experience SUNOO's new system. This new system is designed for people who would like to meet multiple partners within a short period. In addition, in this system, people can use E-Roses to evaluate the extent to which a partner would like them.

Treatments

- 1. 2 Roses: 80% of participants**
 - **Empowerment treatment + 2 Roses: 30%**

 - 2. 8 roses : 20% (and empowerment)**
 - Receive 8 roses
-
- Are proposals with roses more likely to be accepted?
 - Are participants with 8 roses more successful?

Sending a proposal with/without a rose

The screenshot displays a web interface for sending proposals. A central pop-up window titled "이랑이연로 프리포스트" (Proposal) is open, showing a form with a text area and a checkbox labeled "전자장미를 함께 보내시겠습니까?" (Would you like to send a virtual rose together?). Below the form are two buttons: "예" (Yes) and "아니오" (No). The background shows a list of user profiles, with one profile's "이연" (Proposal) button highlighted in red. A sidebar on the left contains navigation links, and a top navigation bar is visible.

Generic note is sent to the other participant

Option to attach a rose

Other participant's Short Profile

Button to send a proposal

Proposals

Men are more active than women

Men:

- 54.28% of men send a proposal, send 1261.
- Those send on average 7.64.
- 53.94% exhaust their proposals.

Women:

- 36.89% of women send a proposal, send 660.
- Those send on average 5.79,
- 27.19% exhaust their proposals.

Roses

Conditioning on sending a proposal, a rose is attached to at least one proposal by:

90.3 percent of men,

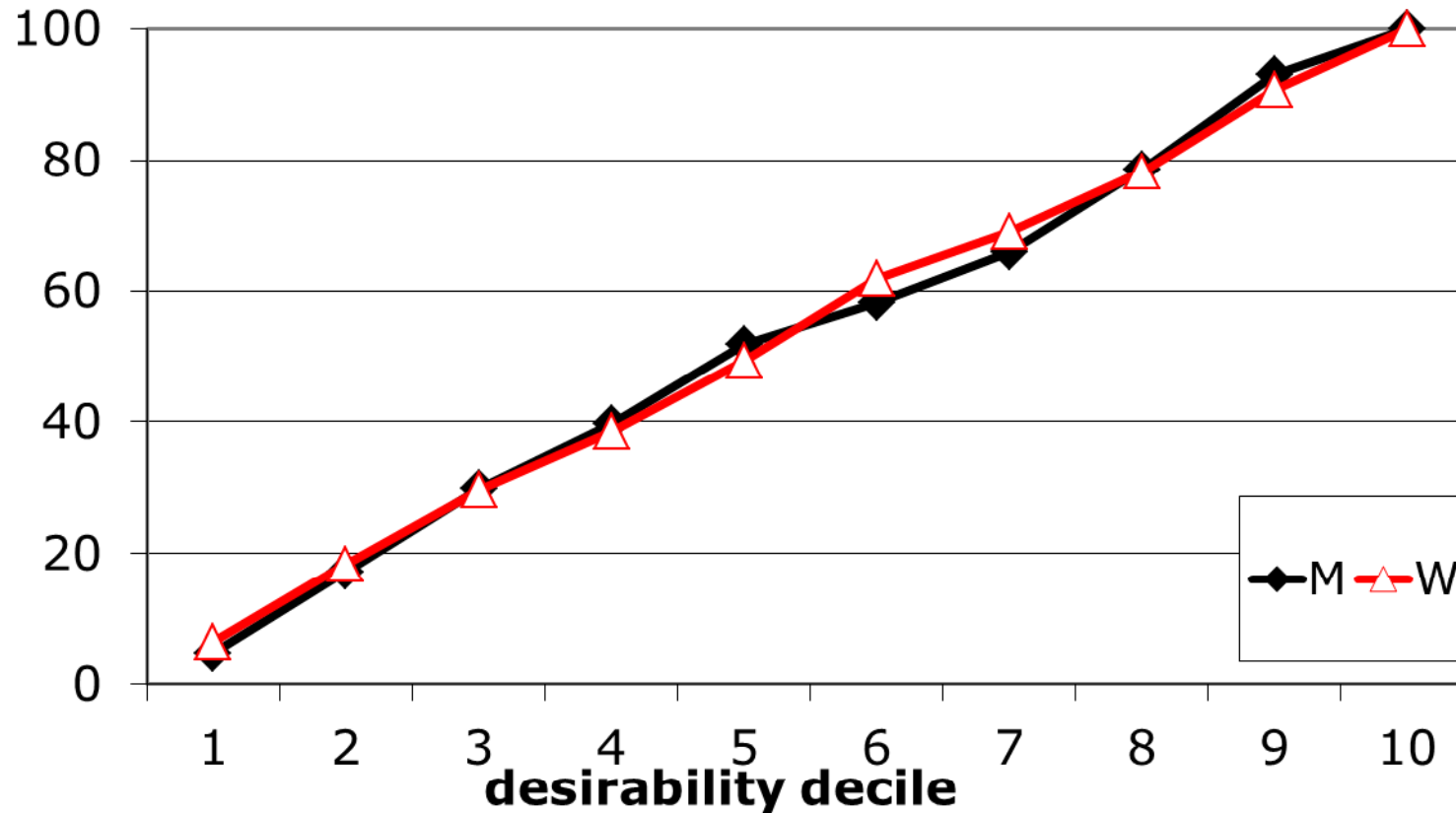
64.91 percent of women

Use up all roses

75% of men, 47% of women

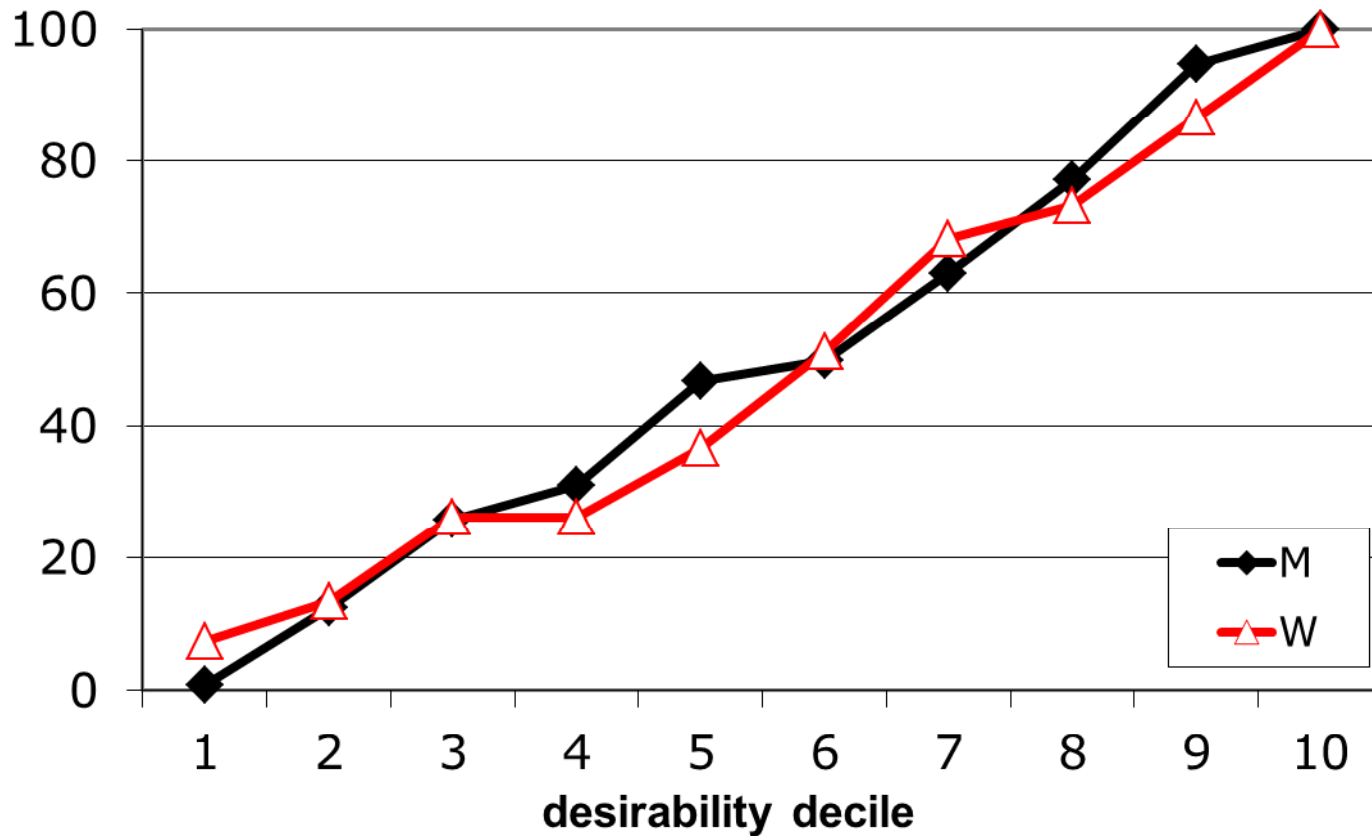
Participants with two roses use on average 1.79 and 1.54 roses (for men and women, respectively),

Fraction of Proposals Initiated by Participants' Type (cumulative)



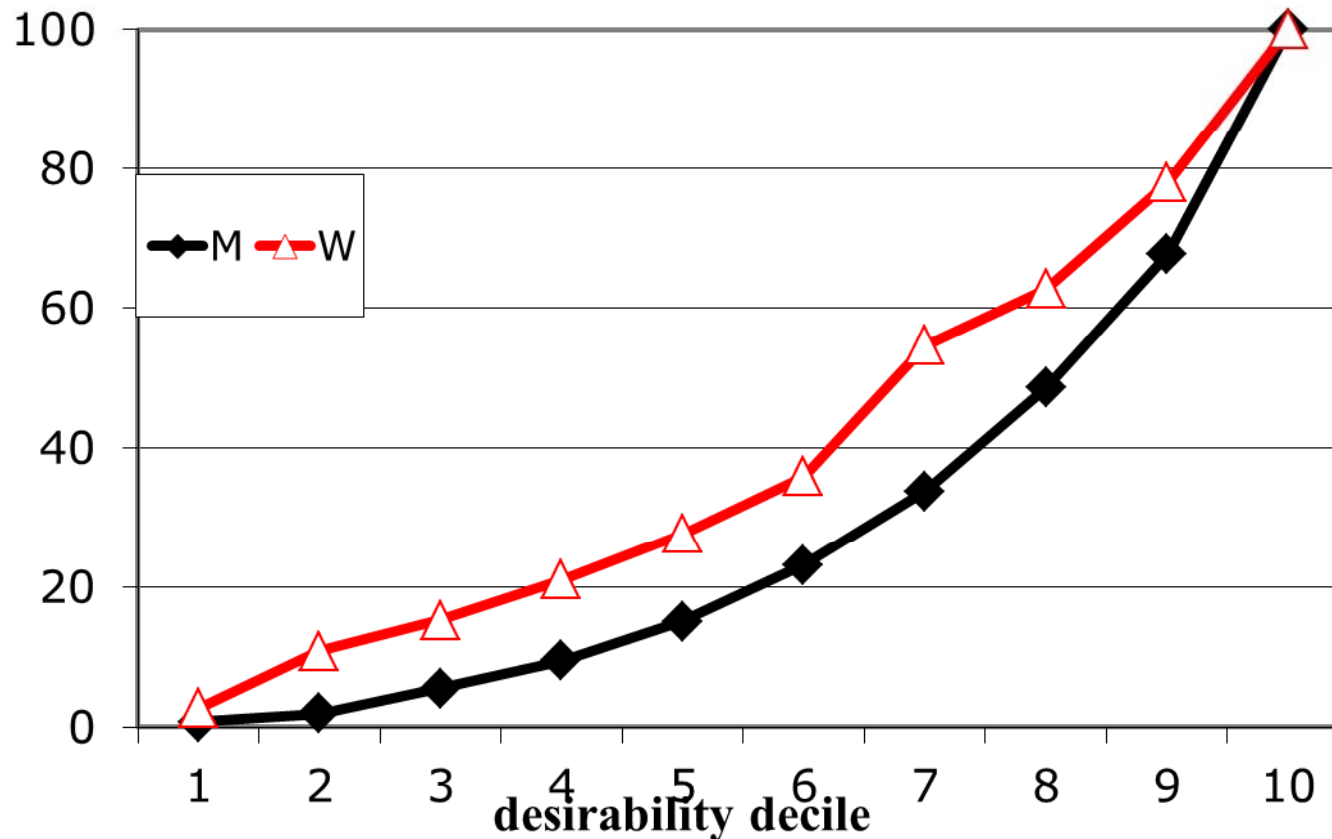
- Participants of each desirability decile are equally active in making proposals

Fraction of Roses sent by Participants' Type (cumulative)



Participants of all desirability levels are equally likely to send a rose

Proportion of received proposals (cumulative)



Desirable participants receive more proposals.
women seem less “diversified” than men.

Who sends a proposal to whom

Distribution of proposals by desirability of sender and recipient

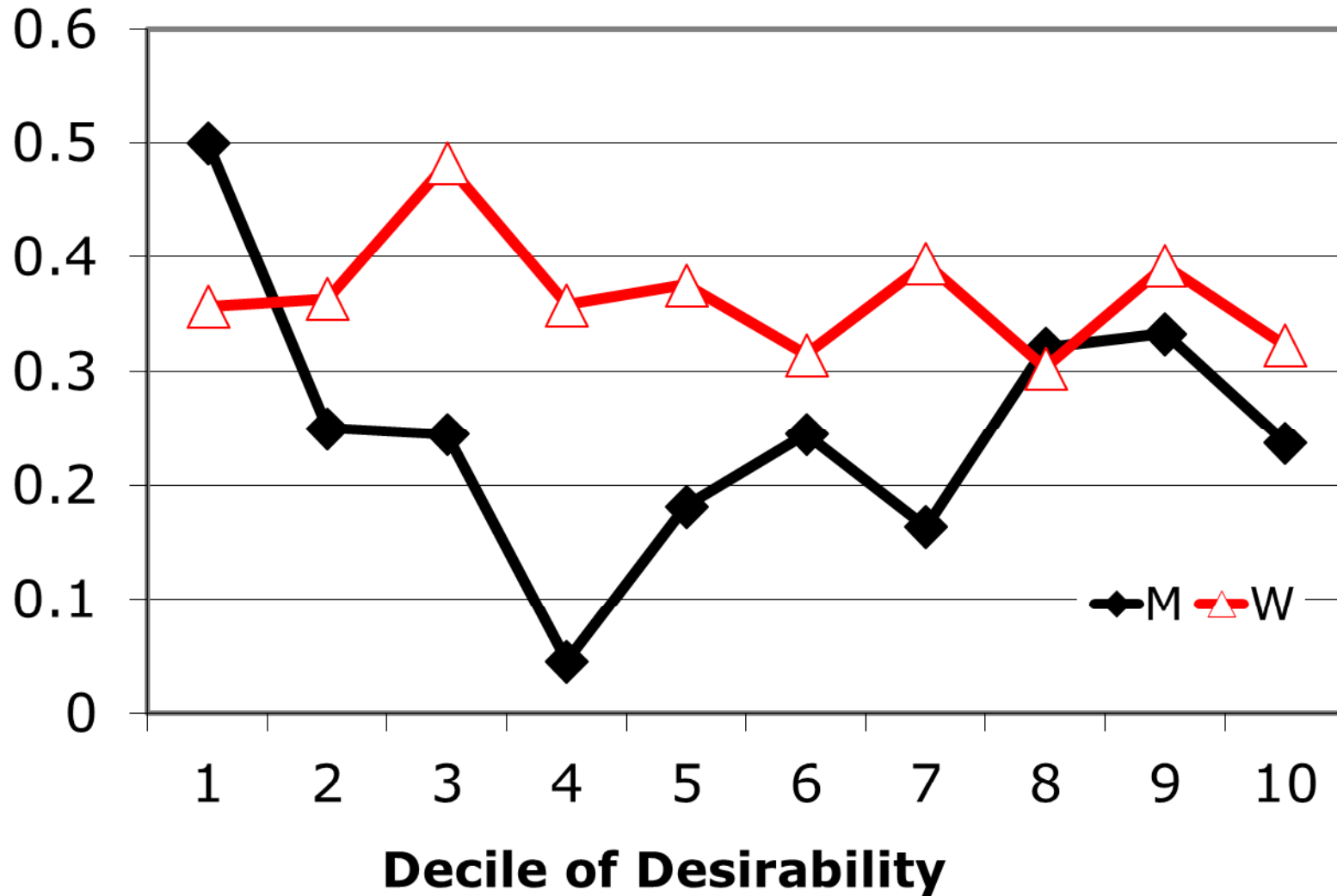
Own Rank	Male Sender			Female Sender		
	Bottom	Middle	Top	Bottom	Middle	Top
Bottom	23.61	39.79	36.60	9.09	37.88	53.03
Middle	12.91	41.58	45.51	5.75	25.67	68.58
Top	10.44	36.66	52.90	1.94	22.33	75.73
Average	15.26	39.37	45.38	5.56	28.27	66.17

The more desirable the sender, the more their proposals go to desirable recipients.

However, large overlap in offers: about 80% for both women and men.

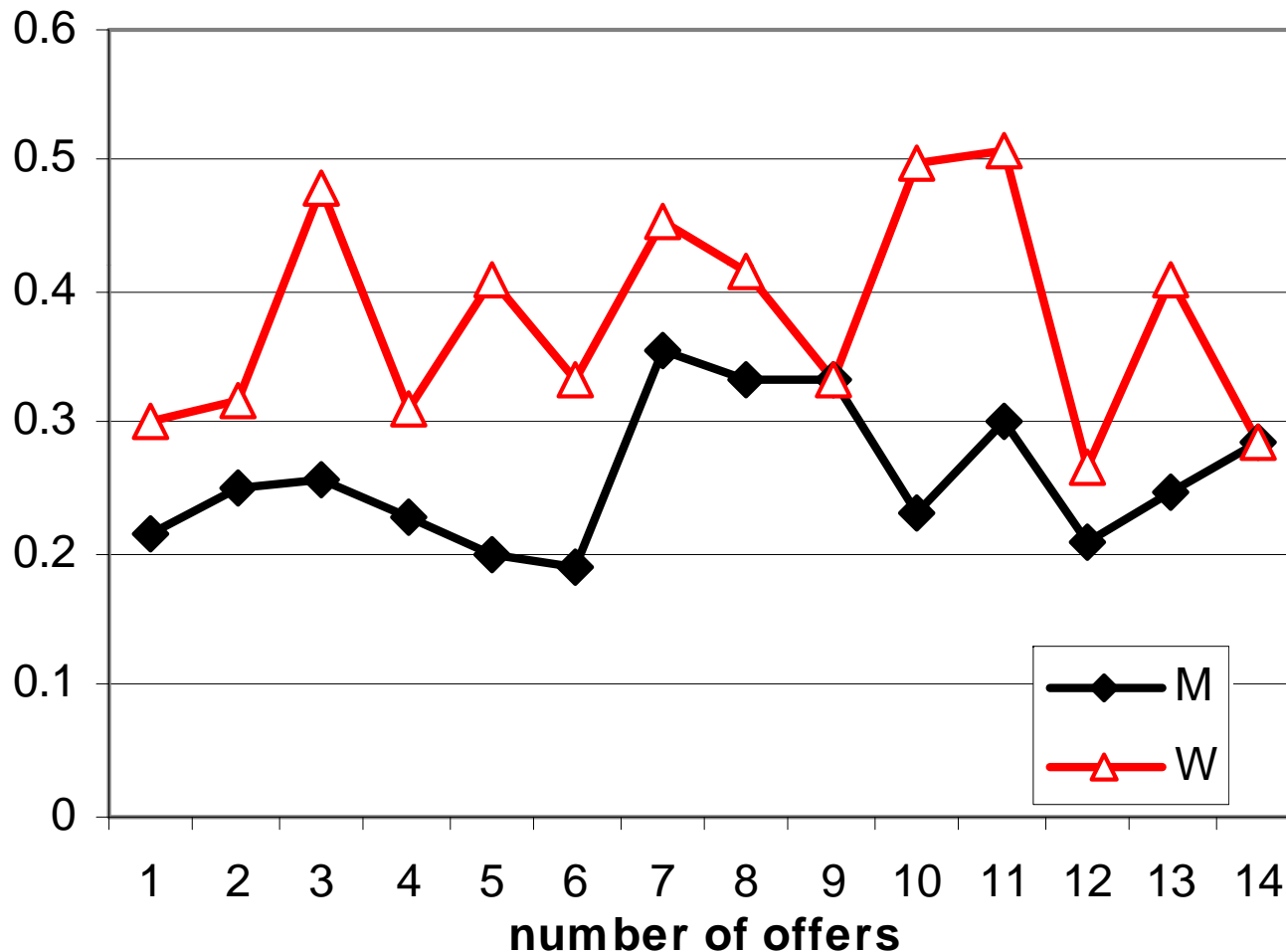
Who receives Roses?

Fraction of proposals with roses



Proportion of Roses by number of offers received

Alternative measure of desirability



Summary: Proposals

Participants of each desirability level are equally active.

Men are more active than women.

More desirable people receive more offers, especially from more desirable senders.

Roses

- Like with proposals: participants of all desirability levels send roses with an equal probability.
- Roses, on aggregate, follow offers “proportionally”, they are not concentrated on the most desirable recipients (which is opposite to proposals).

Accepting a proposal

Window to check received proposals

List of participants who sent a propose and their short profile

Indicate whether you responded to the proposal

	제출자 정보	제출 정보	제출 여부	제출 일자	제출 시간
	[redacted] [redacted] [redacted]	Abstract(KL) / [redacted]	제출완료 [redacted]		2009-04-29
	[redacted] [redacted] [redacted]	Connecticut(CT) / [redacted]	제출완료 [redacted]		2009-01-04
	[redacted] [redacted] [redacted]	[redacted] / [redacted]	제출완료 [redacted]		2009-01-04
	[redacted] [redacted] [redacted]	Abstract(WO) / [redacted]	제출완료 [redacted]		2007-12-10
	[redacted] [redacted] [redacted]	Connecticut(CT) / [redacted]	제출완료 [redacted]		2007-10-27

Informing contact number to a couple for a first date



Your dating partner's Cell phone number is 000-000-0000

Acceptances

After 5 days of making offers, participants receive all proposals (including roses). Participants can say YES / NO / No R.

Yes to at most 10 proposals

168 men and 226 women receive at least one proposal.

About 40% use only Yes or No, we will interpret NR as No.

Acceptance rate: 15.35%, Men: 20.76%, Women: 12,53%

30 participants propose to each other,

- accepted each other w. 3 women not responding

Impact of Roses on Acceptance

Acceptances by Men:

- 478 proposals: no rose: 19.67% accepted
- 182 proposals: rose: 23.63% accepted

Acceptances by Women:

- 773 proposals: no rose: 12.29% accepted
- 488 proposals: rose: 12.91% accepted

Recipients	all	men	women
Rose:	0.033** [0.016]	0.053 [0.033]	0.026 [0.018]
S_Middle	0.048** [0.019]	0.066* [0.037]	0.031 [0.022]
S_Top	0.178*** [0.020]	0.177*** [0.040]	0.175*** [0.023]
R-sq	0.5	0.54	0.46
no of proposals	1,902	657	1,245
no of recipients	393	168	225

Acceptance from the recipients perspective

Roses increase acceptance by about 20%.

Linear recipient fixed effect model.

control variables sender's verification level, age, living in greater Seoul, squared age difference, and dummy of whether the sender lives in the same location

Comparable to benefit enjoyed by Middle rather than Bottom group sender.

Recipients	all	men	women	
Rose: R_Bottom	0.054 [0.047]	0.273 [0.218]	0.038 [0.046]	Top recipients do not react to roses
Rose: R_Middle	0.078*** [0.027]	0.103 [0.076]	0.073*** [0.027]	Middle recipients increase acceptance rate by 40% when the offer comes with a rose.
Rose: R_Top	-0.001 [0.021]	0.035 [0.037]	-0.023 [0.027]	
S_Middle	0.047** [0.019]	0.066* [0.037]	0.029 [0.022]	Effect: larger than benefit: bottom to Middle for Sender.
S_Top	0.176*** [0.020]	0.175*** [0.040]	0.174 [0.023]	
R-sq	0.5	0.54	0.46	
no of proposals	1,902	657	1,245	
no of recipients	393	168	225	

Linear recipient fixed effect model.

control variables sender's verification level, age, living in greater Seoul, squared age difference, and dummy of whether the sender lives in the same location

Bottom recipients: like Middle, but not significant (though often yes if one-sided...).

Recipients	all	men	women
<i>R_Bottom</i>			
S_Bottom Rose	-0.052 (0.064)	0.163 (0.311)	-0.059 (0.062)
S_Middle Rose	0.125* (0.070)	0.500 (0.311)	0.103 (0.068)
S_Top Rose	0.160* (0.084)	0.075 (0.452)	0.136* (0.081)
<i>R_Middle</i>			
S_Bottom Rose	0.106** (0.049)	0.211 (0.151)	0.089* (0.050)
S_Middle Rose	0.019 (0.039)	-0.074 (0.118)	0.039 (0.040)
S_Top Rose	0.124*** (0.040)	0.209* (0.112)	0.102** (0.041)
<i>R_Top</i>			
S_Bottom Rose	-0.003 (0.044)	-0.030 (0.081)	0.008 (0.052)
S_Middle Rose	0.034 (0.032)	0.058 (0.054)	0.021 (0.040)
S_Top Rose	-0.033 (0.032)	0.040 (0.058)	-0.072* (0.037)
<i>S_Middle, S_Top</i>			

Roses increase acceptance, whenever the offer comes from a sender that is in a higher desirability group.

Impact of Roses for Proposers

Men with 8 roses, compared to those with 2 roses have 55% more dates and, more importantly, 61% more initiated dates.

- Even among men who made at least one offer, men with 8 roses: 15% more dates (though not significant).

Women with 8 roses: 12% more dates (n.s.), and 67% more initiated dates.

- Among women who made at least one proposal: 49% more initiated dates.

Do Roses affect the number of acceptances?

Do roses increase the total number of acceptances?

Or do roses displace other acceptances?

Consider active recipients who received 1-3 offers, check their number of accepted offers as a function of whether they received a rose.

Number of accepted proposals

Recipient	Men	Women
	Middle	Middle
Received at least 1 rose	0.648** [0.294]	0.038 [0.283]
Constant	0.727*** [0.152]	0.545** [0.204]
Obs	30	23
R-sq	0.1474	0.0009

Roses increase total number of acceptances among Middle recipients (recipients who most respond to roses)

Preference Signaling Technology: Roses

Use Internet dating: clean market design experiment whether sending a preference signal increases chance of success.

Roses attract positive answers, especially when

- sent to the middle group,
- Sent to less desirable participants than the sender

Participants with 8 roses are more successful: receive more dates.

Roses increase the total number of acceptances.

Market Design: Preference Signaling

- Cheap to implement
- Can affect outcomes